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23586

7590

03/23/2010

ROBERT E MALM
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PACIFIC PALISADES, CA 90272

EXAMINER

ZIMMERMAN, BRIAN A

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 03/23/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,380	07/08/2002	Michael L. Beigel	P313D	4017

TITLE OF INVENTION: ELECTRONIC IDENTIFICATION SYSTEM WITH IMPROVED SENSITIVITY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	06/23/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
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23586 7590 03/23/2010

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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nonprovisional	YES	\$755	\$300	\$0	\$1055	06/23/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ZIMMERMAN, BRIAN A	2612	340-010100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
 Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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ROBERT E MALM 16624 PEQUENO PLACE PACIFIC PALISADES, CA 90272			ZIMMERMAN, BRIAN A	
			ART UNIT	PAPER NUMBER

2612

DATE MAILED: 03/23/2010

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1206 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1206 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/064,380

Examiner

BRIAN A. ZIMMERMAN

Applicant(s)

BEIGEL ET AL.

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Decision CAFC 11/26/2007.
2. ☒ The allowed claim(s) is/are 1-46, 48-55, 58-69, 72-74 and 76-80.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/Brian A Zimmerman/
Supervisory Patent Examiner, Art Unit 2612

Examiner's Amendment

An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment which places this application in condition for allowance. During a telephone conversation conducted on 1/7/2010, Robert Malm discussed and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert Malm on 1/7/2010.

The application has been amended as follows:

Claims 1-46 remain unchanged.

Claims 47,56,57,70,71 and 75 have been deleted.

Claims 48-55 and 58-69 have been amended as follows:

48. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

n means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals,

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim of 47 wherein the bit identifying means comprises:

a means for obtaining at least one weighted integration of the coupling-means signal;

a means for translating the weighted integration(s) into a bit value.

49. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a

second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim of 47 wherein the bit identifying means comprises:

a means for obtaining at least one weighted integration of the amplitude of the coupling-means signal;

a means for translating the weighted integration(s) into a bit value.

50. A tag for use with a reader, the reader communicating a sequence of bits in the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim of 47 wherein the bit identifying means comprises:

a means for obtaining at least one weighted integration of the phase of the coupling-means signal;

a means for translating the weighted integration(s) into a bit value.

51. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called

coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the untransmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim 47 wherein the first signal is a periodic signal with a first value for a predetermined signal parameter and the second signal is the periodic signal with a second value for the predetermined signal parameter, the predetermined signal parameter being one of the signal parameters amplitude, phase, and frequency that characterize the periodic signal, the bit-identifying means comprising:

a means for generating a first replica of the periodic signal with the first value for the predetermined signal parameter and a second replica of the periodic signal with the second value for the predetermined signal parameter;

a means for multiplying the coupling-means signal by the first replica thereby obtaining a first product waveform and by the second replica thereby obtaining a second product waveform;

a means for integrating the first and second product waveforms for a bit period and translating the integration results into a bit value.

52. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a

second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim 47 wherein the first signal is a periodic signal with a first value for a first predetermined signal parameter and the second signal is the periodic signal with a second value for the first predetermined signal parameter, the first predetermined signal parameter being one of the signal parameters amplitude, phase, and frequency that characterize the periodic signal, the periodic signal modulating a second predetermined signal parameter of a carrier signal, the second predetermined signal parameter being one of the signal parameters amplitude, phase, and frequency that characterize the carrier signal, the bit-identifying means comprising:

a means for demodulating the second predetermined signal parameter of the coupling-means signal;

a means for generating a first replica of the periodic signal with the first value for the first predetermined signal parameter and a second replica of the periodic signal with the second value for the first predetermined signal parameter;

a means for multiplying the demodulated coupling-means signal by the first replica thereby obtaining a first product waveform and by the second replica thereby obtaining a second product waveform;

a means for integrating the first and second product waveforms for a bit period and translating the integration results into a bit value.

53. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim 47 wherein the bit-identifying means comprises:

- a means for generating replicas of the first and second signals transmitted by the reader;
- a means for obtaining the amplitude of a coupling-means signal as a function of time;
- a means for multiplying the coupling-means signal amplitude by the replica of the first signal to obtain a first product signal and by the replica of the second signal to obtain a second product signal;
- a means for integrating the first product signal over a bit period to obtain a first integration and integrating the second product signal over a bit period to obtain a second integration;
- a means for translating the first and second integrations into a bit value.

54. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

- a coil;
- a capacitor;
- a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called

coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

The tag of claim 47 wherein the means for generating a bit-timing clock signal that indicates the start of each bit period comprises:

a means for generating a clock signal having a bit-start indicator during each bit period, the bit-start indicators being adjustable in time;

a means for recognizing the bit transition in the coupling-means signal from one bit to the next;

a means for adjusting the bit-start indicators until the bit-start indicators and the bit transitions in the coupling-means signal occur simultaneously.

55. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil and coupling the coil to at least one other means, the signal(s) provided to the other means as a result of the coupling being called coupling-means signal(s), the combination of the coil, the capacitor, and the coupling means being called the resonating circuit;

a means for generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded in the transmitted signals;

a means for identifying the bit being transmitted during each bit period, the beginning and ending of each bit period being indicated by the bit-timing clock signal

~~The tag of claim 47~~ wherein the reader embeds a bit-timing clock signal in the transmitted signals by initially alternating the transmission of the first signal and the second signal, the means for generating a bit-timing clock signal that indicates the start of each bit period comprising:

a means for generating a clock signal having a bit-start indicator during each bit period, the bit-start indicators being adjustable in time;

a means for recognizing the bit transitions in the coupling-means signal resulting from the transitions from the first signal to the second signal and from the second signal to the first signal;

a means for adjusting the bit-start indicators until the bit-start indicators and the transitions in the coupling-means signal occur simultaneously.

58. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the driving signal with a periodic signal having a first phase when a "0" bit is being transmitted and having a second phase when a "1" bit is being transmitted.

59. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the amplitude of the driving signal with a periodic signal having a first phase when a "0" bit is being transmitted and having a second phase when a "1" bit is being transmitted.

60. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

~~The tag of claim 56~~ wherein the means for embedding a sequence of bits comprises:

a means for modulating the phase of the driving signal with a periodic signal having a first phase when a "0" bit is being transmitted and having a second phase when a "1" bit is being transmitted.

61. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

~~The tag of claim 56~~ wherein the means for embedding a sequence of bits comprises:

a means for causing the phase of the driving signal to have a first frequency when a "0" bit is being transmitted and to have a second frequency when a "1" bit is being transmitted.

62. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

~~The tag of claim 56~~ wherein the means for embedding a sequence of bits comprises:

a means for modulating the driving signal with a periodic signal having a first frequency when a "0" bit is being transmitted and having a second frequency when a "1" bit is being transmitted.

63. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the amplitude of the driving signal with a periodic signal having a first frequency when a "0" bit is being transmitted and having a second frequency when a "1" bit is being transmitted.

64. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the phase of the driving signal with a periodic signal having a first frequency when a "0" bit is being transmitted and having a second frequency when a "1" bit is being transmitted.

65. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for causing the phase of the driving signal (1) to have a first phase and a first frequency when a "00" bit pair is being transmitted, (2) to have a first phase and a second frequency when a "01" bit pair is being transmitted, (3) to have a second phase and a first frequency when a "10" bit pair is being transmitted, and (4) to have a second phase and a second frequency when a "11" bit pair is being transmitted.

66. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

~~The tag of claim 56~~ wherein the means for embedding a sequence of bits comprises:

a means for modulating the driving signal with a periodic signal (1) having a first phase and a first frequency when a "00" bit pair is being transmitted, (2) having a first phase and a second frequency when a "01" bit pair is being transmitted, (3) having a second phase and a first frequency when a "10" bit pair is being transmitted, and (4) having a second phase and a second frequency when a "11" bit pair is being transmitted.

67. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the amplitude of the driving signal with a periodic signal (1) having a first phase and a first frequency when a "00" bit pair is being transmitted, (2) having a first phase and a second frequency when a "01" bit pair is being transmitted, (3) having a second phase and a first frequency when a "10" bit pair is being transmitted, and (4) having a second phase and a second frequency when a "11" bit pair is being transmitted.

68. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil,

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

The tag of claim 56 wherein the means for embedding a sequence of bits comprises:

a means for modulating the phase of the driving signal with a periodic signal (1) having a first phase and a first frequency when a "00" bit pair is being transmitted, (2) having a first phase and a second frequency when a "01" bit pair is being transmitted, (3) having a second phase and a first frequency when a "10" bit pair is being transmitted, and (4) having a second phase and a second frequency when a "11" bit pair is being transmitted.

69. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal.

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal

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~~The tag of claim 56~~ wherein the reader transmits the bit-timing clock signal to the tag by communicating a sequence of alternating "0" and "1" bits, a "0" bit being communicated by modulating the amplitude of the driving signal with a first periodic signal, a "1" bit being communicated by modulating the amplitude of the alternating field with a second periodic signal, the means for generating the clock signal that is synchronized to the bit-timing signal transmitted by the reader to the tag comprising:

- a means for generating a clock signal having a bit-start indicator during each bit period, the bit-start indicators being adjustable in time;

- a means for obtaining the amplitude of a coupling-means signal as a function of time;

- a means for recognizing the transitions in the coupling-means signal amplitude at the time interfaces of the first and second periodic signals;

- a means for adjusting the bit-start indicators until the bit-start indicators and the transitions in the coupling-means signal amplitude occur simultaneously.

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